number, twenty-three, or 67.65 per cent., were fully justified both as to direction and velocity; twenty-six, or 76.47 per cent., were justified as to direction, and twenty-two, or 64.71 per cent., were justified as to velocity. One hundred and seventy-seven signals of all kinds were ordered. one hundred and twenty-nine, or 72.88 per cent., being fully justified. These do not include signals ordered at display stations where the velocity of the wind is only estimated. Of the above cautionary off-shore signals, eighteen were changed from cautionary signals. Three signals were ordered late. In sixty-nine cases winds of twenty-five miles or more per hour were reported for which no signals were ordered.

RAILWAY WEATHER SIGNALS.

Prof. P. H. Mell, jr., director of the "Alabama Weather Service," in the report for September, 1885, states:

The verification of predictions for the whole area was 80 per cent. for temperature and 86 per cent. for weather.

The following roads comprise this system: Western, of Alabama; South & North; Montgomery & Mobile; Mobile & Girard; Georgia Pacific; East Tennessee, Virginia & Georgia system in Alabama; Memphis & Charleston; Columbus Western; Atlanta and West Point, of Georgia; Northeastern, of Georgia; Atlanta & Charlotte Air Line; Western & Atlantic; Georgia; East Tennessee, Virginia & Georgia system in Georgia; and Savannah, Florida & Western.

ATMOSPHERIC ELECTRICITY.

AURORAS.

Fort Totten, Dakota, 1st: an aurora was observed from 9 p. m., continuing till 2.10 a. m. of the 2d.

Eastport, Maine, 2d: an auroral light of whitish color was observed from 8 until 11 p. m.

Fort Buford, Dakota, 3d: an auroral arch of whitish color, extending from northwest to northeast and to an altitude of 40°, was observed from 10.20 p. m. until about midnight. A dark segment extended to about 20° above the horizon, and from it streamers of straw color rose upward to, or a few degrees above, the arch,

Fort Totten, Dakota, 3d: an aurora was visible from 10.30 p. m. until daylight of the 4th.

Saint Vincent, Minnesota, 3d: a fine auroral display began at 10.15 p. m. and continued until early morning of the 4th. It consisted of two arches, the upper being but poorly defined. Bright waves of light flashed across the lower arch from east to west.

Alpena, Michigan, 3d: an aurora appeared at 10 p. m., consisting of a diffuse light in the northwestern sky.

Eastport, Maine, 3d: an auroral arch was observed from 7.15 p. m. until 1 a. m. of the 4th.

Manistique, Michigan, 3d: a diffuse auroral light, of moderate brilliancy, was observed from 9 p. m. until midnight; the light extended to an altitude of 40°.

Duluth, Minnesota, 4th: an aurora was visible from 7.30 to 11.30 p. m.

Cresco, Iowa, 4th: an aurora was observed from 8.30 to 10.15 p. m. in the northeastern sky; well-defined beams were observed from 8.45 to 9.

Marquette, Michigan, 4th: an aurora was observed at 10 p. m., consisting of an irregular arch covering 130° of the horizon and extending to an altitude of 40°. The display continued until after midnight.

Alpena, Michigan, 4th: an auroral light was observed at 9.40 p. m.; at 10.08 unusually brilliant streamers appeared in the west. The display was obscured by clouds at 11.45 p. m.

Grand Haven, Michigan, 4th: a faint aurora was observed through the broken clouds from 9.20 to 11.15 p. m.

Bismarck, Dakota, 4th: an aurora appeared at 9.50 and continued until 11.50 p. m. It was quite brilliant at the beginning of the display, when flashes of light were observed.

Saint Vincent, Minnesota, 4th: an aurora was observed at 9.20 p. m. When first noticed it consisted of pale, slender streamers, reaching an altitude of 30°. At 10.15 a well-defined arch appeared, from which streamers extended to the zenith. The aurora continued until 3 a. m. on the 5th, when it was obscured by clouds.

Moorhead, Minnesota, 4th: a faint aurora appeared at 9 p. m.; it assumed the form of an arch at 10.15, and several streamers appeared, extending upward 60°; the display ended at 11 p. m.

Fort Totten, Dakota, 4th: an auroral light was visible at dusk; three arches, 5°, 15°, and 40° altitude, respectively, with occasional shooting beams, were observed; the display ended at 8.40 p. m.

Fort Yates, Dakota, 4th: an aurora was visible from 10.15 to 10.20 p. m., covering 60° of the horizon and extending to an altitude of 10°.

Saint Paul, Minnesota, 4th: an auroral display was visible from 9.45 to 11.45 p. m., consisting at first of a deep yellowish glow, changing at 10 p. m. to a double arch, with broad streamers reaching from 20° to 40° above the horizon. At 11.45 all traces of the aurora had disappeared.

Fort Bennett, Dakota, 4th: at 12.15 a. m. an aurora, which was probably obscured during its greatest brilliancy, was observed in the form of a partial arch, covering 45° of the horizon and extending to an altitude of 20°; no streamers were seen.

Fort Sully, Dakota, 4th: a faint auroral arch was observed from 10.45 to 11.50 p. m.

Poplar River, Montana, 4th: an aurora, resembling morning dawn, appeared at 10.25 p. m. and remained visible until 4.30 a. m. of the 5th.

Fort Totten, Dakota, 14th: an auroral arch of 20° altitude was observed in the north from 9.30 p. m. until 3 a. m. of the 15th.

Alpena, Michigan, 14th: an aurora appeared at 10 p. m. and continued till 11.58.

Mount Washington, New Hampshire, 14th: a diffuse auroral light, having an altitude of 12° and extending over 80° of the horizon, was observed from 11.11 to 11.26 p. m.

Eastport, Maine, 14th: a faint auroral light was observed at 7 p. m. The display continued till 1 a. m. of the 15th.

Huron, Dakota, 15th: an aurora appeared in the northeast and north soon after midnight. At times bright beams rose almost to the zenith from an arch which extended along the horizon.

Valentine, Nebraska, 15th: an aurora was visible in the north-northeastern sky, with faint streamers extending upward 25°. The display was observed from 10.45 to 11.30 p. m.

Fort Benton, Montana, 15th: a brilliant aurora was observed through breaks in clouds during the evening.

Yankton, Dakota, 15th: very faint aurora, in the form of an arch with long streamers, was observed at 10.15 p. m.; at 11.10 streamers were shorter but more numerous.

La Crosse, Wisconsin, 15th: an aurora was observed from 9 p. m. until 2 a. m. of the 16th. At 9.50 a perfect arch was formed, with a few streamers reaching an altitude of 40°; at 10.30 a double arch extended along the horizon, the upper arch being indistinct; after midnight only a diffuse light remained.

Saint Paul, Minnesota, 15th: an auroral light was observed in the north at 9.35 p m.; at 9.50 an arch formed; a few beams appeared between 10 and 10.15 p. m.; at 10.25 a band of light rose from the western horizon and extended across the sky, forming a complete arch which remained visible until 11.15 p. m. The aurora disappeared at 1.30 a. m. of the 16th. During the display telegraphic communication was interfered with to some extent.

Keokuk, Iowa, 15th: at 8.45 p. m. an auroral arch of pale yellow, covering 50° of the horizon, was observed; the display continued until 10.50 p. m.

Fort Yates, Dakota, 15th: a bright auroral display was observed from 9.30 to 11.55 p. m. A bright band of light, 1° in width, extended across the sky from east to west at 11.10.

Fort Buford, Dakota, 15th: a brilliant display of the aurora was observed from 9.54 to 11.30 p. m.; it was most brilliant from 10.38 to 10.40, when bright streamers extended to the zenith.

Fort Totten, Dakota, 15th: a brilliant auroral display was visible from 9.20 p. m. until 12.40 a. m. of the 16th.

Table of miscellaneous meteorological data for September, 1885—Signal Service observations.

Stations.	Elevation above sea-level.	Atmospheric pressure (in inches and hundredths). Mean actual barometer.	Departure from normal.	Mean reduced barometer.	Extremes. Highest barometer	Date.	Lowest barometer	Date.	Monthly range of barometer.	Temperature of the air (in degrees Fahrenheit). Monthly mean.	Departure from normal.	Extremes. Max.	Date.	Mean max	Min.	Date.	Mean min.	Monthly range.	Daily ranges. Greatest.	Date.	Least.	Date.	Mean rel. humidity.	Mean dew-point.	Precipitation.	Departure from normal.	Winds. Total movement.	Prevailing direction.	Maximum velocity. Miles p. h.	Direction.	Date.	No. of rainy days.	No. of cloudy days.	No. of fair days.	No. of clear days.
New England.																																			
Eastport	61	29.90	—.06	29.97	30.37	26	28.76	23	1.61	54.4	— 1.3	70.7	16	61.6	38.0	24	47.8	32.7	22.8	3	7.9	27	81.6	48.6	3.64	0.00	5,033	s.	40	se.	23	7	4	11	15
Portland	99	29.90	—.03	30.00	30.36	26	29.14	23	1.22	57.0	— 3.9	82.1	14	65.8	38.3	24	47.5	43.8	26.9	18	10.1	29	77.1	49.4	1.37	— 1.60	5,221	s.	25	nw.	2	8	4	9	17
Mount Washington	6,279	23.81	...	29.96	30.28	26	29.21	23	1.07	37.3	— 3.4	55.0	13	45.0	12.7	24	32.0	42.3	32.7	23	6.2	14	89.2	34.0	5.56	— 3.34	21,265	w.	90	nw.	23	13	0	14	16
Boston	125	29.89	—.04	30.02	30.38	26	29.18	23	1.21	59.6	— 2.8	84.3	14	69.2	38.7	24	51.1	45.6	27.4	9	5.6	28	71.1	49.5	1.70	— 1.37	6,977	w.	37	nw.	23	7	4	12	14
Block Island	27	30.02	—.02	30.04	30.40	26	29.28	22	1.12	61.4	— 3.3	77.7	15	67.3	42.7	23	55.8	35.0	19.1	23	6.1	28	80.5	55.2	1.60	— 1.80	8,819	sw.	37	nw.	23	5	2	12	16
Narragansett Pier	...	...	...	...	...	...	...	...	...	59.5	...	80.2	15	68.7	36.0	24	50.2	44.2	...	...	...	...	...	...	1.39	— 1.38	...	...	...	...	...	9	...	...	...
Point Judith	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
New Haven	107	29.94	...	30.04	30.38	25	29.34	22	1.05	60.7	— 3.7	83.0	15	72.0	38.5	24	51.0	44.5	28.5	24	15.2	14	76.0	52.3	0.77	— 3.15	4,292	s.	24	n.	23	5	1	12	17
New London	47	30.02	.00	30.06	30.41	26	29.32	22	1.09	61.0	— 2.4	79.4	15	69.5	39.5	24	52.2	39.9	23.4	12	11.5	2	76.4	53.3	1.44	— 1.94	4,056	sw.	23	s.	9	6	1	10	19
Middle Atlantic States.																																			
Albany	83	29.96	—.02	30.04	30.35	26	29.37	22	0.98	60.0	— 3.4	84.2	9	71.8	40.9	24	50.7	43.3	30.7	9	12.7	16	73.6	50.6	2.00	— 1.48	3,945	s.	22	s.	13	8	5	9	16
New York City	164	29.99	—.01	30.06	30.39	26	29.34	23	1.04	64.1	— 1.5	83.8	15	73.4	43.5	24	57.1	40.3	25.5	27	10.4	5	70.5	53.6	0.72	— 2.92	4,127	nw.	37	nw.	23	9	1	12	17
Philadelphia	117	29.96	.00	30.07	30.39	26	29.46	22	0.93	65.2	— 1.6	84.8	15	75.8	44.4	24	57.5	40.4	26.4	27	7.9	22	68.6	53.5	1.17	— 2.30	6,128	sw.	33	nw.	23	9	5	11	14
Atlantic City	13	30.05	—.01	30.05	30.36	26	29.40	22	0.96	64.7	— 2.6	80.6	15	71.6	44.0	24	58.4	36.6	23.1	24	2.7	21	80.1	58.0	1.59	— 1.91	5,781	ne.	28	ne.	10	6	3	17	10
Barnegat City	22	30.05	.00	30.06	30.38	26	29.41	22	0.96	64.8	— 1.9	82.1	15	71.2	43.2	24	58.8	38.9	24.5	24	5.0	11	81.2	58.7	1.38	— 3.67	8,304	e.	44	nw.	23	7	4	11	15
Cape May	27	30.03	...	30.04	30.33	26	29.40	22	0.93	66.9	— 1.2	83.0	9	73.6	52.1	17	60.2	30.9	23.8	6	6.5	23	76.4	58.8	0.81	— 3.35	9,243	s.	56	nw.	23	5	7	9	14
Little Egg Harbor	...	...	...	...	...	...	...	...	...	66.1	...	82.2	15	72.5	44.7	24	59.7	37.5	...	...	...	...	...	...	1.43	— 2.25	...	...	...	...	...	5	...	...	...
Sandy Hook	28	30.05	.00	30.07	30.40	26	29.42	22	0.98	64.7	— 2.5	85.0	15	73.5	46.5	24	58.5	38.5	21.8	24	8.3	21	83.0	59.1	0.58	— 4.12	9,569	se.	53	nw.	23	5	3	9	18
Cape Henlopen	...	...	...	...	...	...	...	...	...	66.6	...	91.1	9	74.1	43.5	24	59.1	47.6	...	...	...	...	...	...	1.26	...	...	...	...	...	...	7	...	...	...
Baltimore	45	30.04	.00	30.07	30.36	26	29.51	22	0.86	66.9	— 1.2	85.9	9	75.5	45.7	24	59.2	40.2	25.4	24	5.1	22	67.7	55.0	1.30	— 2.73	3,531	nw.	22	nw.	23	8	4	16	10
Ocean City*	...	...	...	...	...	...	...	...	...	67.0	...	82.1	5	72.5	43.4	24	61.7	38.7	...	...	...	...	...	...	0.83	...	...	...	...	...	...	3	...	...	...
Washington City	106	29.98	.00	30.08	30.36	26	29.55	22	0.81	66.1	— 1.8	90.7	9	76.1	44.0	24	57.2	46.7	28.7	25	4.8	22	71.2	55.3	2.15	— 1.96	2,924	s.	23	nw.	23	5	7	12	11
Cape Henry	16	30.06	.00	30.06	30.34	26	29.53	22	0.81	70.4	— 1.7	89.4	14	77.8	52.7	25	63.8	36.7	24.2	25	3.7	21	75.3	61.7	2.33	— 2.90	9,326	ne.	51	nw.	23	5	5	10	15
Chincoteague	8	30.07	+.01	30.06	30.35	26	29.48	22	0.87	67.3	— 3.2	82.3	15	72.8	44.1	24	59.0	38.2	21.2	19	7.6	21	76.6	59.1	3.13	+ 0.63	5,721	ne	37	n.	22	7	4	8	18
Lynchburg	652	29.40	.00	30.06	30.34	26	29.60	22	0.73	67.4	— 1.4	90.7	9	77.8	46.2	24	58.6	44.5	26.9	24	9.6	22	71.7	56.5	1.38	— 2.08	2,041	s.	23	nw.	23	5	10	11	9
Norfolk	30	30.07	+.02	30.08	30.30	26	29.58	22	0.72	70.0	— 1.0	89.3	9	77.7	51.4	24	63.0	37.9	23.2	14	4.4	21	74.2	60.7	3.31	— 1.56	4,830	ne.	25	ne.	22	4	4	15	11
South Atlantic States.																																			
Cape Lookout	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Charlotte	808	29.24	.00	30.05	30.28	18	29.68	22	0.60	69.9	— 1.3	89.1	9	78.4	47.6	24	62.1	41.5	25.1	25	8.2	21	70.5	59.0	3.45	+ 0.22	3,381	ne.	19	e.	21	5	9	13	8
Fort Macon	11	30.06	.00	30.04	30.28	17	29.52	22	0.77	72.6	— 2.4	83.6	16	77.9	57.0	24	68.0	26.6	15.4	8	5.0	15	89.2	69.2	6.31	— 1.17	10,212	ne.	52	se.	21	8	6	14	10
Hatteras	12	30.05	—.02	30.04	30.29	26	29.40	22	0.89	72.1	— 3.2	85.0	15	77.3	57.0	24	67.7	28.0	14.4	14	5.5	2	80.6	65.5	7.27	— 0.05	7,266	ne.	36	nw.	22	6	4	15	11
Kitty Hawk	9	30.07	—.02	30.06	30.33	26	29.43	22	0.90	70.7	— 2.1	91.2	15	76.2	52.4	24	65.7	38.8	19.1	14	3.6	21	81.9	64.6	4.62	— 1.46	8,947	ne.	56	n.	22	3	5	15	10
New River Inlet	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Portsmouth	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scott's Hill	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Smithville	34	30.02	—.02	30.03	30.25	18	29.59	22	0.65	74.0	— 0.6	85.8	16	78.8	48.7	24	66.8	37.1	22.5	24	6.2	20	83.6	68.5	6.94	+ 0.48	7,393	e.	28	se.	21	8	8	13	9
Wash Woods	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wilmington	52	30.00	—.02	30.03	30.26	17	29.58	22	0.68	73.1	— 0.3	89.0	16	81.1	51.6	24	65.8	37.4	22.4	24	6.3	21	80.8	66.5	5.69	— 2.19	4,347	e.	17	ne.	21	6	7	18	5
Charleston	52	29.99	—.02	30.01	30.20	18	29.70	22	0.50	76.4	— 0.3	91.3	9	81.8	63.0	22	71.1	28.3	15.5	9	4.0	30	81.8	70.7	3.32	— 3.45	5,765	e.	76	e.	17	14	11	12	6
Augusta	183	29.87	—.04	30.02	30.24	18	29.74	22	0.49	73.8	— 1.1	95.2	16	84.3	51.8	25	66.6	43.4	30.2	25	5.9	21	78.6	65.6	2.78	— 1.20	3,154	ne.	19	ne.	21	12	12	11	7
Savannah	87	29.94	—.04	30.00	30.18	17	29.73	21	0.45	76.0	+ 0.2	90.3	9	81.4	62.0	24	71.0	28.3	14.7	24	5.0	27	82.1	69.8	12.00	+ 6.76	5,501	e.	27	ne.	29	17	11	13	6
Jacksonville	43	29.95	—.06	29.96	30.10	12	29.73	21	0.37	78.3	+ 0.5	92.5	9	85.8	67.9	23	73.2	24.6	17.5	8	4.6	24	84.6	72.7	19.63	+ 12.48	3,835	ne.	30	se.	29	20	11	14	5
Florida Peninsula.																																			
Cedar Keys	22	29.93	—.09	29.91	30.06	12	29.74	30	0.32	79.9	+ 0.3	91.2	17	85.7	68.5	23	74.7	22.7	15.7	12	4.7	25	84.8	74.6	5.76	+ 0.24	5,063	w.	28	e.	11	12	9	18	3
Key West	20	29.96	—.03	29.93	30.06	3	29.77	30	0.29	84.0	+ 1.2	92.3	6	89.8	72.1	23	79.0	20.2	16.8	22	5.0	29	81.6	77.6	5.23	+ 0.63	4,544	e.	33	nw.	22	14	7	18	5
Sanford	?25	29.96	...	29.96	30.09	12	29.74	30	0.35	78.5	+ 0.5	93.8	6	89.4	68.4	24	72.6	25.4	21.7	5	7.8	26	86.9	73.6	10.73	+ 7.10	2,921	ne.	20	se.	12	20	6	16	8
Eastern Gulf States.																																			
Atlanta	1,129	28.89	—.04	30.03	30.25	18	29.81	22	0.43	69.5	— 2.1	87.2	15	76.4	53.0	24	63.8	34.2	19.0	24	2.5	30	81.1	62.6	6.51	+ 3.78	7,086	e.	28	e.	27	12	9	13	8
Pensacola	30	29.94	—.07	29.93	30.08	18	29.71	27	0.37	78.3	+ 1.0	89.2	15	84.3	65.3	23	73.4	23.9	18.4	23	3.9	19	82.7	74.2	5.5[illegible]	— 1.23	4,599	ne.	35	e.	26	15	12	18	0
Mobile	35	29.94	—.07	29.94	30.12	18	29.70	27	0.42	76.6	— 0.2	90.4	15	84.9	59.8	24	70.8	30.6	23.0	24	6.6	26	85.1	71.2	9.25	+ 4.22	4,824	n.	25	ne.	26	16	8	18	4
Montgomery	219	29.77	—.06	29.96	30.17	18	29.73	30	0.44	75.2	— 0.3	90.7	15	83.2	55.0	24	68.2	35.7	25.4	24	5.9	26	83.2	69.1	4.83	+ 2.06	3,612	ne.	22	e.	26	15	11	12	7
Vicksburg	209	29.77	—.07	29.96	30.13	18	29.80	27	0.33	73.9	— 1.1	92.0	15	83.4	53.0	24	67.1	39.0	27.8	2	5.2	27	81.1	66.9	9.28	+ 5.14	3,217	ne.	20	se.	11	17	12	14	4
New Orleans	52	29.90	—.07	29.92	30.07	18	29.69	26	0.38	77.1	— 0.9	92.0	13	85.2	65.8	24	72.1	26.2	20.8	24	5.4	26	86.4	72.3	13.55	+ 9.25	4,6 5	ne.	28	n.	26	17	10	16	4
Western Gulf States.																																			
Shreveport	227	29.75	—.06	29.95	30.13	18	29.83	28	0.30	75.2	+ 0.4	95.2	14	85.5	54.8	24	68.2	40.4	28.7	2	7.0	27	78.2	67.0	6.70	+ 2.49	...	ne.	...	...	...	15	7	13	10
Fort Smith	470	29.50	—.04	29.96	30.20	18	29.73	8	0.46	71.2	— 1.3	90.6	4	83.0	49.1	25	62.3	41.5	34.6	25	10.4	17	75.0	61.7	0.99	— 3.40	3,054	e.	16	n.	29	5	8	11	11
Little Rock	299	29.67	—.06	29.94	30.15	18	29.74	8	0.41	73.5	+ 1.2	90.0	12	83.1	55.6	25	67.0	34.4	27.2	25	7.1	27	79.8	66.2	2.06	— 1.10	3,543	ne.	20	ne.	27	7	8	15	7
Galveston	40	29.93	—.04	29.93	30.05	1	29.82	20	0.22	79.9	+ 0.3	90.7	10	84.3	68.5	28	75.3	22.2	13.6	26	5.1	18	81.8	73.6	26.01	+ 19.76	8,038	s.	35	n.	20	13	8	11	11
Indianola	26	29.91	—.06	29.90	30.03	1	29.74	19	0.29	79.5	+ 0.2	91.0	9	85.6	69.3	25	71.3	21.7	16.6	29	5.5	19	83.4	73.7	10.36	— 3.61	9,686	s.	60	ne.	19	14	5	14	11
Palestine	533	29.44	—.06	29.95	30.12	18	29.82	11	0.30	74.8	— 1.0	93.3	12	84.8	58.4	28	68.0	34.9	24.4	2	8.8	17	80.8	67.6	4.63	+ 1.88	5,891	ne.	28	sw.	13	11	8	11	11
San Antonio	781	29.14	...	29.90	30.04	14	29.76	11	0.28	77.0	— 0.6	96.0	13	88.7	58.8	30	69.3	37.2	28.0	30	10.7	15	75.5	67.6	1.51	— 3.54	3,861	n.	16	se.	12	10	5	14	11
Rio Grande Valley.																																			
Brownsville	59	29.87	—.05	29.88	29.97	1	29.79	19	0.18	79.3	— 0.4	93.0	13	89.2	68.4	25	74.1	21.6	20.4	25	9.8	20	84.6	73.6	3.55	— 2.30	4,690	s.	22	s.	3	12	9	13	8
Rio Grande City	230	29.73	—.03	29.88	29.98	22	29.75	11	0.24	81.6	0.0	100.0	1	92.0	67.7	24	74.9	32.3	22.7	1	10.0	20	76.8	72.3	5.24	+ 2.18	4,434	se.	19	se.	12	8	4	14	12
Ohio valley & Tennessee.																																			
Chattanooga	783	29.23	—.04	30.02	30.24	18	29.80	22	0.44	69.4	— 1.1	87.4	15	77.9	51.3	24	63.0	36.1	22.9	12	3.7	30	81.5	62.8	6.48	+ 2.74	3,508	ne.	19	ne.	16	13	12	13	5
Knoxville	980	29.05	—.04	30.04	30.26	18	29.78	22	0.47	68.9	+ 0.4	88.3	12	79.5	44.7	24	60.6	43.6	33.8	24	7.4	30	72.3	58.5	2.21	— 0.71	3,621	e.	27	w.	8	15	11	11	8
Memphis	321	29.68	—.05	29.99	30.17	18	29.78	30	0.39	72.7	+ 1.3	88.3	3	81.6	51.8	24	66.1	36.5	26.0	24	6.0	27	76.5	64.0	4.42	+ 1.46	3,707	nw.	20	sw.	8	11	8	13	9
Nashville	549	29.45	—.04	30.00	30.22	18	29.76	8	0.45	70.3	— 0.3	88.2	12	80.0	46.2	24	63.0	42.0	30.3	24	6.2	29	74.0	60.8	5.60	+ 2.26	4,049	e.	33	nw.	22	8	11	13	6
Louisville	551	29.48	+.01	30.06	30.26	17	29.66	8	0.60	68.2	— 0.8	86.2	12	77.5	45.2	23	60.3	41.0	28.0	25	5.0	30	73.6	58.5	5.71	+ 2.92	4,220	s.	28	sw.	8	9	9	10	11
Greencastle	897	29.10	...	30.02	30.26	17	29.54	8	0.72	63.4	...	80.3	19	71.6	39.2	23	56.5	41.1	27.3	22	3.6	29	75.9	55.0	6.01	...	3,783	se.	22	sw.	8	10	10	5	15
Indianapolis	766	29.24	—.02	30.02	30.27	17	29.54	8	0.73	63.9	— 2.0	83.8	18	74.8	38.4	23	54.7	45.4	32.3	24	5.5	9	72.9	53.8	3.50	+ 0.88	3,144	s.	21	nw.	22	8	11	7	12
Cincinnati	628	29.40	+.01	30.04	30.26	17	29.60	8	0.66	65.7	— 2.6	84.2	12	75.8	40.9	24	56.9	43.3	33.8	25	6.4	10	71.9	55.2	2.72	+ 0.43	3,776	se.	40	nw.	22	7	8	13	9
Columbus	805	29.21	—.02	30.04	30.28	17	29.62	8	0.66	63.8	— 2.4	82.1	27	74.2	39.1	24	53.7	43.0	34.4	25	9.6	5	75.6	55.0	2.84	+ 0.37	3,905	sw.	27	n.	22	6	6	14	10
Pittsburg	766	29.25	—.02	30.04	30.28	20	29.56	22	0.72	64.6	— 0.3	87.0	26	76.6	43.3	24	54.5	43.7	34.5	26	8.2	10	69.9	53.2	1.69	— 0.90	2,918	s.	25	nw.	22	8	7	10	13
Lower lake region.																																			
Buffalo	690	29.31	—.01	30.03	30.32	17	29.53	22	0.79	60.0	— 2.2	82.6	28	68.0	41.0	23	52.3	41.6	25.9	28	4.9	26	78.0	52.7	4.88	+ 1.84	6,869	sw.	41	w.	23	11	6	14	10
Oswego	335	29.66	—.03	30.01	30.31	17	29.48	22	0.83	58.0	— 4.5	79.1	13	66.6	40.1	23	49.8	39.0	31.1	22	7.4	16	73.9	49.1	3.62	+ 1.14	7,004	s.	38	n.	22	9	8	11	11
Rochester	621	29.38	—.01	30.03	30.32	17	29.49	22	0.83	58.9	— 3.2	82.0	28	71.2	40.5	2	50.0	41.5	35.3	21	10.0	16	80.7	52.5	2.49	+ 0.17	6,755	sw.	28	sw.	14	10	6	15	9
Erie	681	29.32	—.02	30.03	30.30	17	29.59	8	0.72	61.4	— 2.7	81.1	13	70.7	43.0	23	53.8	38.1	26.5	22	8.6	18	68.5	50.2	3.42	— 0.90	6,583	w.	35	nw.	1	10	5	12	13
Cleveland	690	29.32	—.02	30.03	30.30	17	29.57	8	0.73	61.5	— 2.2	84.2	28	71.1	43.9	24	54.0	40.3	30.8	25	5.9	10	77.4	53.8	2.01	— 1.89	6,260	se.	30	n.	22	11	7	12	11
Sandusky	639	29.38	.00	30.04	30.30	17	29.53	8	0.77	63.4	— 2.1	84.0	25	72.3	43.0	2	55.0	41.0	32.0	25	7.6	10	68.4	51.9	1.82	— 1.68	7,724	sw.	44	n.	22	6	7	11	12
Toledo	651	29.36	.00	30.03	30.30	17	29.50	8	0.80	63.0	— 1.1	81.9	20	71.5	39.7	23	54.9	42.2	27.0	22	5.1	10	77.8	55.5	2.17	— 0.28	5,179	sw.	27	w.	3	6	4	11	15
Detroit	661	29.34	—.02	30.02	30.30	17	29.51	8	0.79	62.7	0.0	81.3	26	70.8	40.7	23	54.9	40.6	22.5	22	7.7	4	71.4	52.7	1.54	— 1.14	6,354	sw.	29	nw.	22	5	3	15	12
Upper lake region.																																			
Alpena	609	29.35	—.02	30.00	30.25	19	29.59	14	0.66	55.4	— 1.6	88.0	26	65.9	37.0	6	47.2	52.6	30.7	22	5.1	8	78.9	48.2	3.76	— 0.90	6,894	w.	32	nw.	22	6	3	16	11
Escanaba	608	29.30	—.03	29.96	30.20	16	29.52	14	0.68	55.3	— 1.2	76.8	22	64.3	30.0	23	46.8	46.8	38.7	22	7.4	12	74.4	46.5	1.69	— 2.70	6,883	sw.	32	n.	22	11	6	16	8
Grand Haven	620	29.35	—.01	30.00	30.22	27	29.49	8	0.73	59.6	— 1.4	79.9	29	67.1	39.1	23	52.3	40.8	23.8	27	6.6	1	75.8	51.5	4.71	+ 0.79	6,813	s.	32	n.	22	9	9	9	11
Mackinaw City	605	29.34	—.05	29.99	30.23	19	29.56	21	0.67	55.6	— 2.2	79.6	20	63.8	38.0	23	49.1	41.6	31.2	22	5.9	30	77.9	48.3	0.69	— 1.49	7,581	nw.	34	e.	9	9	3	18	9
Marquette	672	29.23	—.0	29.96	30.25	19	29.51	12	0.73	55.5	— 1.1	87.1	21	67.0	34.5	23	46.1	52.6	38.4	20	8.5	30	69.2	44.4	1.00	— 4.23	7,027	w.	36	sw.	17	8	6	15	9
Port Huron	633	29.35	—.01	30.02	30.28	17	29.51	8	0.77	59.0	— 2.2	86.1	26	68.4	38.8	2	50.4	47.3	28.9	21	9.2	16	78.5	51.8	2.06	— 0.42	5,940	ne.	33	ne.	2	11	4	15	11
Chicago	661	29.32	—.00	29.01	30.22	18	29.44	8	0.78	63.9	— 0.0	81.3	21	70.6	47.1	6	58.3	34.2	22.5	25	5.0	30	71.8	54.0	2.79	+ 0.22	5,726	sw.	25	s.	8	9	9	8	13
Milwaukee	697	29.26	—.01	29.99	30.22	18	29.41	8	0.81	60.0	— 0.9	83.8	21	69.2	40.6	23	53.0	43.2	25.4	25	6.0	9	74.8	51.2	3.30	+ 0.18	7,509	sw.	39	e.	8	7	9	7	14
Duluth	672	29.23	—.01	29.96	30.26	30	29.27	12	1.00	53.9	— 2.4	79.3	18	64.1	38.1	5	47.1	41.2	29.6	20	4.5	27	71.1	43.5	2.35	— 2.23	5,627	ne.	28	ne.	16	5	2	22	6

Table of miscellaneous meteorological data for September, 1885—Signal Service observations—Continued.

Stations.	Elevation above sea-level.	Atmospheric pressure (in inches and hundredths). Mean actual barometer.	Departure from normal.	Mean reduced barometer.	Extremes. Highest barometer	Date.	Lowest barometer	Date.	Monthly range of barometer.	Temperature of the air (in degrees Fahrenheit). Monthly mean.	Departure from normal.	Extremes. Max.	Date.	Mean max	Min.	Date.	Mean min.	Monthly range.	Daily ranges. Greatest.	Date.	Least.	Date.	Mean rel. humidity.	Mean dew-point.	Precipitation.	Departure from normal.	Winds. Total movement.	Prevailing direction.	Maximum velocity. Miles p. hr	Direction.	Date.	No. of rainy days.	No. of cloudy days.	No. of fair days.	No. of clear days.
Extreme northwest.																																			
Moorhead	923	28.92	—0.4	29.92	30.30	30	29.33	12	0.97	56.6	+ 1.2	92.0	25	71.8	26.0	5	43.5	66.0	40.6	8	15.2	8	69.1	44.5	2.20	— 0.54	7,287	s.	48	s.	10	4	2	14	14
Saint Vincent	804	29.03	—0.4	29.91	30.38	29	29.35	12	1.03	53.1	+ 0.7	82.2	19	68.0	24.0	30	40.2	58.2	40.2	18	13.4	11	79.4	46.2	0.98	— 1.16	5,839	s.	34	w.	14	6	6	10	14
Bismarck	1,694	28.13	—0.2	29.93	30.31	30	29.48	12	0.83	57.1	+ 1.3	95.0	24	71.4	32.4	30	44.4	62.6	47.9	24	11.1	7	62.5	42.1	0.14	— 1.30	4,248	n.	29	n.	25	2	3	11	16
Fort Buford	1,930	27.90	—0.3	29.93	30.30	29	29.46	13	0.84	55.5	+ 1.5	90.5	23	72.0	29.5	4	41.5	61.0	47.2	15	14.5	7	61.1	40.0	0.26	— 0.61	5,266	nw.	32	sw.	13	3	3	22	5
Fort Totten	1,500	28.31	...	29.91	30.33	29	29.44	12	0.90	54.1	...	96.0	24	68.1	29.4	4	41.7	66.6	50.7	24	7.3	8	64.1	39.8	0.13	...	8,603	nw.	40	nw.	14	3	1	16	13
Upper Mississippi Valley																																			
Saint Paul	831	29.07	0.0	29.95	30.24	5	29.36	12	0.88	59.1	+ 0.3	88.2	25	71.6	35.4	6	49.3	52.8	34.2	25	13.0	14	74.6	49.9	3.52	+ 0.17	5,852	se.	27	sw.	12	7	3	16	11
La Crosse	725	29.20	—0.1	29.96	30.22	18	29.38	8	0.84	61.4	— 0.1	84.2	21	70.0	42.8	5	53.7	41.4	24.1	25	6.4	8	74.4	52.4	4.78	— 0.34	5,566	s.	31	ne.	8	9	5	10	15
Davenport	615	29.36	—0.1	30.00	30.23	23	29.41	8	0.82	63.0	— 1.3	83.0	19	72.4	44.9	23	55.4	38.1	26.1	24	4.4	30	73.4	53.3	4.19	+ 0.96	5,135	sw.	31	sw.	8	10	10	10	10
Des Moines	849	29.10	—0.1	29.98	30.29	1	29.39	8	0.90	63.5	— 0.3	87.1	21	73.0	45.2	23	55.6	41.9	28.8	15	4.3	8	77.6	55.5	4.82	+ 1.63	3,694	sw.	22	s.	12	11	12	9	9
Dubuque	665	29.30	...	29.99	30.24	18	29.38	8	0.86	61.7	— 1.0	85.6	21	71.4	41.9	6	53.3	43.7	27.5	24	4.5	30	75.1	52.7	4.58	— 0.31	3,009	nw.	16	s.	12	13	8	10	12
Keokuk	618	29.35	—0.1	29.99	30.24	1	29.49	8	0.74	64.6	— 1.7	84.1	21	73.7	46.1	23	56.5	38.0	28.2	24	4.1	30	75.0	55.6	3.77	+ 0.13	5,153	s.	27	s.	12	11	9	8	13
Cairo	359	29.66	—0.4	30.01	30.23	18	29.70	8	0.53	69.3	— 0.3	85.4	22	76.5	50.6	23	62.8	34.8	22.4	24	4.0	29	70.9	61.1	4.70	+ 2.19	4,204	n.	30	s.	8	12	10	13	7
Springfield	644	29.34	—0.3	29.99	30.23	18	29.54	8	0.68	64.9	— 1.4	82.3	21	73.1	44.5	23	56.9	37.8	27.4	24	4.4	29	70.7	54.1	4.47	+ 1.21	4,024	s.	29	sw.	8	9	7	10	13
Saint Louis	571	29.43	—0.1	30.01	30.24	18	29.59	8	0.65	68.4	+ 0.2	84.0	21	76.3	50.1	23	62.0	33.9	21.1	24	4.4	29	74.6	59.3	8.98	+ 6.18	6,730	se.	48	w.	4	11	10	7	13
Missouri Valley.																																			
Lamar	1,028	28.95	...	30.00	30.25	18	29.70	8	0.55	66.3	...	85.6	21	77.2	49.6	23	58.0	36.0	29.2	25	4.8	30	79.6	58.9	13.24	...	5,914	se.	30	ne.	5	11	7	12	11
Leavenworth	842	29.12	—0.1	29.98	30.29	1	29.60	8	0.69	66.1	— 1.1	85.5	21	75.5	46.0	2	56.0	39.5	30.5	24	7.0	30	75.2	57.1	7.65	+ 4.39	4,294	s.	21	s.	12	12	8	5	17
Omaha	1,113	28.85	+0.1	29.99	30.34	1	29.51	11	0.83	64.5	+ 0.8	88.9	21	74.0	45.5	5	56.8	43.4	27.4	15	6.1	8	75.3	55.5	2.50	— 1.10	6,235	s.	26	s.	11	8	7	10	13
Valentine	2,603	27.29	...	29.92	30.40	1	29.47	11	0.94	59.8	...	94.2	24	74.0	35.4	30	48.1	58.8	45.8	24	7.3	6	61.4	43.2	2.23	...	7,410	s.	54	n.	11	6	7	7	16
Fort Bennett	1,510	28.38	...	29.97	30.34	30	29.57	24	0.78	60.1	— 0.1	94.2	24	73.8	34.2	30	49.2	60.0	47.4	24	3.0	7	67.4	47.3	1.47	+ 0.28	4,964	s.	29	n.	16	6	6	9	15
Fort Sully	...	...	...	...	...	...	...	...	...	63.1	...	97.6	24	77.1	34.3	5	49.0	63.3	...	...	...	...	...	...	1.77	+ 0.64	...	n.	...	...	...	...	...	...	...
Huron	1,305	28.57	—0.1	29.95	30.30	5	29.40	11	0.90	59.1	+ 1.1	90.7	25	72.6	31.1	5	48.3	59.0	40.4	24	5.7	8	75.7	50.7	2.61	+ 0.88	5,782	se.	31	se.	10	7	5	11	14
Yankton	1,228	28.67	—0.1	29.96	30.33	1	29.37	11	0.96	62.4	+ 1.2	91.6	20	74.9	37.7	5	52.2	53.9	40.9	24	3.2	7	73.5	52.5	4.80	+ 2.07	5,664	se.	37	e.	12	7	6	12	12
Northern slope.																																			
Fort Assinaboine	2,720	27.10	+0.5	29.97	30.27	4	29.54	9	0.73	57.3	+ 4.1	92.7	23	72.3	35.7	20	43.9	57.0	43.8	22	11.8	3	54.1	39.5	0.17	— 1.34	7,714	w.	51	sw.	9	4	4	9	17
Fort Benton	2,681	27.17	...	30.01	30.32	4	29.56	9	0.76	57.9	+ 1.8	93.4	23	74.6	33.6	20	44.2	59.8	51.9	18	11.3	4	54.1	38.9	0.25	— 0.85	5,300	sw.	42	w.	9	5	4	17	9
Fort Custer	3,040	26.82	—0.1	29.94	30.23	4	29.53	24	0.70	59.1	+ 1.7	95.0	23	75.0	36.0	17	45.0	60.0	49.2	23	10.8	4	55.2	40.5	0.68	— 0.07	4,571	e.	39	nw.	13	7	4	14	12
Fort Maginnis	4,340	25.54	...	29.94	30.18	21	29.60	13	0.58	54.0	+ 2.5	88.7	23	68.6	28.9	5	41.6	59.8	39.7	27	9.8	4	67.2	42.9	1.13	+ 0.58	6,561	w.	44	w.	9	14	10	16	4
Fort Shaw	3,550	26.31	...	29.93	30.19	4	29.49	9	0.70	56.0	+ 3.6	90.2	23	71.4	33.4	20	42.9	56.8	44.3	18	13.2	2	57.4	39.5	0.25	— 1.53	5,619	w.	68	sw.	13	4	6	15	9
Helena	4,044	25.81	—0.5	29.93	30.17	30	29.55	9	0.62	55.4	— 0.6	88.1	23	69.2	37.8	17	44.9	50.3	37.8	18	6.8	5	69.6	44.8	0.11	— 1.75	4,329	sw.	23	sw.	12	3	5	14	11
Poplar River	2,030	27.80	...	29.90	30.32	1	29.51	24	0.80	54.4	...	91.5	23	72.4	24.2	4	38.2	67.3	53.0	15	15.4	2	71.9	44.0	0.15	+ 0.66	4,882	w.	36	n.	25	4	1	10	19
Deadwood	4,600	25.41	+0.2	29.97	30.27	1	29.64	11	0.63	54.7	+ 1.3	83.3	24	65.1	35.5	4	44.1	47.8	34.1	15	6.3	6	70.7	44.4	0.90	— 0.10	2,901	ne.	16	ne.	25	6	4	7	19
Cheyenne	6,105	24.07	—0.1	29.94	30.19	22	29.54	11	0.65	55.7	+ 0.2	84.8	24	70.1	34.2	17	43.7	50.6	38.0	15	10.6	5	59.3	39.2	0.69	— 0.20	7,192	nw.	44	w.	13	9	1	16	13
North Platte	2,841	27.07	—0.1	29.93	30.30	1	29.36	11	0.94	62.2	+ 0.5	90.0	24	74.3	42.9	14	51.7	47.1	41.6	24	6.4	6	71.0	51.0	0.86	— 0.54	6,293	s.	38	nw.	11	7	6	8	16
Middle slope																																			
Denver	5,294	24.80	0.0	29.90	30.18	22	29.47	11	0.70	61.9	+ 0.8	89.6	23	76.0	42.3	29	49.6	47.1	36.2	15	6.4	6	54.0	41.9	1.22	+ 0.32	4,561	s.	36	nw.	12	9	3	13	14
Pike's Peak	14,134	18.01	...	29.98	30.21	22	29.66	11	0.55	31.0	— 1.2	47.3	17	38.1	13.0	12	23.1	34.3	16.5	10	5.4	30	79.0	25.0	1.04	— 0.89	10,956	sw.	52	nw.	13	10	2	11	17
West Las Animas	3,899	26.06	0.0	29.86	30.17	1	29.41	11	0.76	63.9	— 1.5	95.6	16	81.9	35.6	13	48.9	60.0	52.9	13	11.5	5	66.5	50.0	0.99	+ 0.52	4,563	e.	32	n.	1	5	3	10	17
Concordia	1,384	28.52	...	29.94	30.27	1	29.47	11	0.80	65.6	...	94.0	24	77.4	45.8	9	56.2	48.2	35.6	23	5.1	28	74.2	55.9	3.53	...	6,836	s.	35	s.	12	8	5	9	16
Dodge City	2,517	27.41	0.0	29.92	30.23	1	29.45	11	0.78	66.0	— 1.2	88.0	24	78.5	48.0	5	56.6	40.0	35.0	24	8.0	5	72.3	55.0	3.48	+ 2.41	9,129	se.	51	nw.	7	8	4	8	18
Fort Reno	...	...	...	...	...	...	...	...	...	75.0	...	95.4	24	84.8	50.2	30	65.3	45.2	...	...	...	...	...	...	3.62	+ 0.40	...	...	...	...	...	7	...	...	...
Fort Supply	...	...	...	...	...	...	...	...	...	70.8	...	91.2	4	82.2	50.5	30	59.3	40.7	...	...	...	...	...	...	3.41	+ 0.89	...	...	...	...	...	9	...	...	...
Southern slope.																																			
Fort Sill	1,200	28.73	—0.5	29.92	30.14	18	29.63	11	0.50	71.7	— 1.2	91.0	4	84.3	52.5	25	60.7	38.5	34.0	24	10.0	28	75.8	62.4	2.83	+ 0.11	5,503	n.	30	s.	11	5	2	15	13
Fort Concho ‡	1,900	28.04	—0.8	29.91	30.11	15	29.70	11	0.41	76.3	...	94.0	5	88.6	63.0	15	66.4	31.0	28.7	4	10.0	9	77.9	68.0	2.21	...	2,395	s.	24	w.	9	5	3	9	3
Fort Davis	4,928	25.52	—0.2	29.88	30.00	22	29.74	11	0.26	68.1	+ 1.1	89.0	8	83.1	49.5	24	57.5	39.5	33.7	13	16.0	18	58.2	50.4	1.58	— 0.58	3,937	ne.	29	n.	1	5	0	10	20
Fort Stanton †	...	...	...	...	...	...	...	...	...	61.9	...	85.0	20	77.0	32.0	25	46.9	53.0	...	...	...	...	...	...	1.36	...	...	...	...	...	...	3	...	...	...
Southern plateau.																																			
El Paso	6,764	26.26	—0.1	29.88	30.08	18	29.66	11	0.42	72.6	+ 0.1	93.2	4	88.7	48.9	25	60.9	44.3	38.4	14	14.4	30	45.3	47.7	0.22	— 1.14	2,512	e.	19	ne.	21	5	2	6	22
Lava	...	...	...	...	...	...	...	...	...	68.4	...	102.0	16	82.9	48.0	14	53.9	54.0	...	...	...	...	...	...	0.06	...	...	...	...	...	...	1	...	...	...
Santa Fé	7,026	23.36	+0.5	29.92	30.10	18	29.65	11	0.45	59.7	+ 0.7	81.0	20	72.5	40.0	28	48.5	41.0	34.0	13	15.0	6	49.2	39.0	1.87	+ 0.62	4,743	sw.	26	w.	12	6	0	13	17
Fort Apache	5,050	25.07	+0.2	29.84	29.98	23	29.70	11	0.28	65.0	+ 3.0	93.2	20	85.4	38.2	28	48.4	55.0	47.3	14	24.6	7	47.3	42.7	0.44	— 1.33	4,741	e.	25	sw.	6	4	0	9	21
Fort Bowie	...	...	...	...	...	...	...	...	...	67.1	...	90.0	3	89.1	37.0	30	45.2	59.0	...	...	...	...	...	...	0.44	...	...	...	...	...	...	4	...	...	...
Fort Grant	4,856	25.24	...	29.81	29.91	23	29.69	11	0.22	72.4	+ 1.4	91.3	17	84.2	55.8	11	62.7	35.5	26.2	13	15.8	18	36.7	42.3	0.81	— 0.47	4,974	se.	37	se.	17	7	0	7	23
Fort McDowell	...	...	...	...	...	...	...	...	...	82.2	...	111.5	20	101.5	51.5	28	62.9	60.0	...	...	...	...	...	...	0.90	...	...	...	...	...	...	1	...	...	...
Fort Thomas	2,710	27.18	...	29.79	29.94	13	29.64	25	0.20	75.1	+ 2.4	98.5	19	92.4	43.0	28	56.5	55.5	47.8	14	16.7	10	40.2	45.2	0.02	— 0.64	...	s.	...	...		1	0	6	24
Fort Verde	...	...	...	...	...	...	...	...	...	74.1	+ 0.8	99.0	21	92.5	45.0	28	55.8	53.0	...	...	...	...	...	...	0.03	— 1.24	...	...				2			
Maricopa	...	...	...	...	...	...	...	...	...	84.2	...	108.5	17	101.6	44.6	3	66.9	63.9	...	...	...	...	...	...	trace	...	...	...	...	...	...	1	...	...	...
Phoenix	...	...	...	...	...	...	...	...	...	79.3	— 1.8	112.7	20	104.1	43.9	8	54.5	68.8	...	...	...	...	...	...	0.07	— 0.74	...	...	...	...	...	1	...	...	...
Prescott	5,389	24.76	0.0	29.88	30.01	1	29.69	11	0.32	64.9	+ 1.9	89.6	17	82.8	39.4	27	49.3	50.2	41.1	28	17.8	11	43.6	39.7	0.11	— 1.14	4,478	s.	36	s.	6	1	0	3	27
San Carlos	...	...	...	...	...	...	...	...	...	78.0	...	101.8	3	94.8	49.0	29	61.3	52.8	...	...	...	...	...	...	0.34	— 0.52	...	...	...	...	...	2	...	...	...
Wickenburg	...	...	...	...	...	...	...	...	...	78.2	+ 3.6	106.5	21	98.1	48.5	29	58.3	58.0	...	...	...	...	...	...	0.04	— 0.71	...	...	...	...	...	1	...	...	...
Willcox	...	...	...	...	...	...	...	...	...	71.4	...	100.0	17	91.8	42.0	28	51.0	58.0	...	...	...	...	...	...	1.11	...	...	...	...	...	...	3	...	...	...
Keeler	...	26.26	...	...	...	...	...	...	0.44	74.1	...	97.2	2	87.1	49.7	25	62.1	47.5	29.3	1	14.7	24	32.3	41.3	0.00	...	3,580	sw.	42	s.	24	0	0	1	29
Middle plateau																																			
Winnemucca	4,332	25.62	+0.1	29.91	30.14	30	29.59	24	0.55	61.7	+ 1.6	88.4	1	76.6	30.8	26	44.0	57.6	43.5	28	15.2	25	32.1	28.3	0.08	— 0.31	4,734	sw.	33	sw.	24	1	1	4	25
Frisco	...	23.74	...	...	...	...	...	...	0.45	63.6	...	81.5	22	73.8	36.0	11	55.2	45.5	26.5	13	11.7	24	29.7	29.1	0.07	...	7,973	sw.	42	sw.	25	1	0	6	24
Salt Lake City	4,348	25.62	—0.2	29.86	30.07	21	29.53	24	0.54	64.8	+ 0.6	90.0	23	77.9	42.4	12	52.3	47.6	35.4	13	13.3	10	52.7	45.3	1.29	+ 0.44	3,584	se.	22	se.	24	4	6	9	15
Montrose	5,800	24.35	...	29.95	30.13	22	29.64	11	0.49	59.8	...	86.0	22	77.5	31.1	13	45.7	54.9	41.7	15	16.9	11	51.6	38.6	0.53	...	5,907	se.	36	se.	11	6	2	10	18
Fort Bridger	...	23.56	...	...	...	...	...	...	0.55	51.8	...	78.7	22	68.8	30.6	12	38.4	48.1	41.8	3	17.9	12	56.6	34.5	0.99	...	5,282	sw.	30	sw.	13	5	4	7	19
Northern plateau.																																			
Cœur d'Alene	...	...	...	...	...	...	...	...	...	58.6	...	87.0	3	72.3	36.0	27	44.9	51.0	...	...	...	...	...	...	1.21	+ 0.27	...	...	...	...	...	5	...	...	...
Lewiston	785	29.13	...	29.91	30.26	30	29.56	23	0.70	63.1	+ 3.4	89.6	22	76.4	41.5	20	52.0	48.1	35.4	22	12.2	10	58.2	46.7	0.66	+ 0.04	2,183	se.	26	sw.	9	4	3	8	19
Ashland	...	...	...	...	...	...	...	...	...	61.9	...	90.0	14	81.4	34.0	21	42.4	56.0	...	...	...	...	...	...	1.18	...	...	...	...	...	...	2	...	...	...
Linkville	...	...	...	...	...	...	...	...	...	55.9	...	82.0	14	72.4	32.5	11	39.4	49.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dayton	1,667	28.22	...	29.97	30.24	30	29.65	9	0.59	60.3	+ 2.1	88.4	1	76.6	36.0	27	47.3	52.4	40.0	14	13.5	9	61.3	45.1	1.15	+ 0.32	3,771	sw.	25	sw.	13	8	3	8	19
Fort Spokane *	...	...	...	...	...	...	...	...	...	58.5	...	88.0	1	74.0	34.0	27	42.9	54.0	...	...	...	...	...	...	1.14	...	...	...	...	...	...	6	...	...	...
North Pacific coast region																																			
Fort Canby	179	29.75	...	29.95	30.19	16	29.69	23	0.50	58.5	...	69.7	21	62.6	49.1	16	54.0	20.6	14.8	16	4.4	12	90.7	55.8	3.43	...	5,893	w.	42	w.	23	17	8	15	7
Olympia	36	29.91	—0.9	29.95	30.21	16	29.60	9	0.62	57.9	+ 2.3	73.9	14	68.2	43.2	18	49.8	30.7	28.8	17	6.7	28	86.6	53.6	3.69	+ 0.70	2,719	n.	20	nw.	14	15	6	15	9
Port Angeles	14	29.91	...	29.93	30.21	1	29.56	9	0.65	52.9	...	66.9	2	60.4	37.7	25	46.7	29.2	20.8	25	5.3	28	92.6	50.7	3.25	...	2,686	s.	20	nw.	24	15	9	11	10
Pysht	...	...	...	...	...	...	...	...	...	55.8	...	72.0	2	63.5	42.0	24	48.0	30.0	...	...	...	...	...	...	9.44	...	...	...	...	...	...	18	...	...	...
Tattoosh Island	86	29.83	...	29.93	30.21	1	29.55	9	0.66	56.0	...	65.6	4	60.5	49.2	15	51.9	16.4	15.6	2	4.2	19	91.7	53.5	9.60	...	7,829	sw.	37	s.	20	16	18	8	4
Astoria	...	...	...	...	...	...	...	...	...	60.6	...	72.0	3	66.5	49.0	20	54.7	23.0	...	...	...	...	...	...	4.24	...	...	...	...	...	...	15	...	...	...
Portland	80	29.88	—0.8	29.97	30.24	16	29.71	9	0.53	62.2	+ 1.7	85.0	22	75.8	41.0	25	51.1	44.0	35.0	17	12.0	28	73.8	52.9	2.48	+ 0.66	3,597	nw.	21	sw.	12	9	6	12	11
Roseburg	523	29.44	—0.2	29.99	30.18	1	29.68	23	0.49	62.3	+ 1.9	89.4	14	78.0	37.8	20	49.0	52.1	40.0	26	11.0	24	66.9	49.7	0.36	— 0.64	1,510	nw.	16	sw.	28	6	3	11	16
Mid. Pacific coast region																																			
Cape Mendocino	637	29.30	0.0	29.97	30.09	15	29.80	23	0.28	57.6	+ 0.4	76.6	30	63.4	48.0	2	51.8	28.6	21.6	30	6.9	16	81.4	51.7	1.59	+ 0.66	14,310	n.	47	se.	23	3	0	9	21
Red Bluff	332	29.53	—0.3	29.86	30.00	13	29.67	23	0.33	74.8	+ 1.0	99.5	20	88.4	51.5	25	60.7	48.0	35.0	20	16.5	5	39.2	45.5	2.91	+ 2.49	4,081	nw.	24	s.	24	1	0	3	27
Sacramento	64	29.81	—0.3	29.86	29.97	1	29.74	10	0.23	69.8	+ 0.7	98.5	22	88.2	50.5	26	56.3	48.0	41.8	20	14.0	24	52.6	49.4	0.08	— 0.25	4,468	s.	20	nw.	25	1	0	3	27
San Francisco	60	29.86	—0.4	29.91	30.01	1	29.80	10	0.21	60.7	+ 1.0	87.0	21	68.3	52.0	2	55.1	35.0	27.0	21	5.5	3	80.1	53.8	0.11	— 0.05	6,688	n.	32	w.	23	1	5	10	15
South Pacific coast region																																			
Los Angeles	371	29.47	—0.9	29.82	29.98	1	29.68	20	0.21	69.5	+ 2.0	108.5	21	84.9	51.2	20	56.6	57.3	47.6	20	15.9	11	75.9	59.9	0.05	+ 0.05	2,562	w.	18	w.	21	0	0	12	18
San Diego	67	29.81	—0.3	29.85	29.97	13	29.71	20	0.26	68.0	+ 1.3	89.5	21	75.1	56.5	27	61.7	33.0	27.4	21	8.4	14	80.9	61.4	trace	— 0.05	3,735	nw.	20	nw.	18	0	0	18	2
San Luis Obispo	277	29.65	...	29.92	30.04	13	29.80	20	0.24	63.2	...	102.0	21	80.0	46.9	5	51.2	55.1	47.1	22	15.0	7	74.1	53.3	0.02	...	4,242	w.	28	n.	20	0	0	10	20

* Record for 28 days. ‡ Record for 15 days. † Record for 27 days.

Moorhead, Minnesota, 15th: a very brilliant aurora appeared at 9.15 p. m., with waves of light extending upwards 50°; at 11.45 it was very faint.

Saint Vincent, Minnesota, 15th: an aurora appeared at 9.20 p. m. as an irregular arch extending over 160° of the horizon and to an altitude of 45°. At 10.15 the arch faded away and was immediately followed by bright, yellow streamers which extended to within 5° to 10° of the zenith. The display continued until early morning of the 16th.

Bismarck, Dakota, 15th: at 9.35 p. m. an auroral light extended from azimuth 175° to 235° and to an altitude of 20°; at 11 p. m. a band of pale, yellow light extended from horizon to horizon, passing about 4° south of the zenith and distant about 56° from the light in the north. This band disappeared at 11.35, when the light in the north attained its greatest brilliancy and streamers appeared. The display continued until 4.30 a. m. of the 16th.

Chicago, Illinois, 15th: an aurora is reported to have been observed by persons in the surrounding country, though it was not seen at this station. Streamers and "merry dancers" were noted, but during the greater part of the display only a diffuse, straw-colored light was observed.

Marquette, Michigan, 15th: an aurora was observed at 9.35 p. m.; at 11 p. m. the phenomenon assumed a peculiar form; the arch having partly disappeared, waves of light, resembling puffs of smoke, rose from the horizon and converged to a point 10° south of the zenith. At one time these waves of light covered 45° of the sky.

Mackinaw City, Michigan; during the evening of the 15th and the early morning of the 16th indications of the existence of an auroral display were observed, at times, through breaks in the clouds.

Escanaba, Michigan, 15th: an aurora was observed at 9.36 p. m.; from 10.37 to 11.11 p. m. bright flashes, having a waving motion, were observed. The display ended at 11.29 p. m.

Detroit, Michigan, 15th: an aurora was observed at 10.30 p. m.; pale streamers shot upward to an altitude of 45°; these soon disappeared.

Sandusky, Ohio, 15th: a faint aurora, covering 90° of the northern horizon, was observed from 10 to 11 p. m.

Erie, Pennsylvania, 15th: an aurora was observed from 9.15 to 11.20 p. m. consisting of beams reaching various altitudes between 5° and 90°, with a quick, lateral motion from northwest to northeast.

Buffalo, New York, 15th: when the sky cleared at 11 p. m., a beautiful auroral display was visible; it is probable that had not cloudiness prevailed it would have been seen earlier. It consisted of an arch of light from which beams of whitish color shot upward, at times reaching the zenith, and having a quivering motion.

Logansport, Indiana, 15th: a bright aurora appeared at 9 p.m.; at 9.30 the light was very brilliant, and numerous streamers flashed upward to an altitude of 25°. The moonlight diminished the brilliancy of the display; and at 10 p. m. no traces of it remained.

Albany, New York, 15th: an auroral light was visible from 8 to 10.20 p. m., covering 60° of the horizon and extending to an altitude of 20°; several streamers of whitish color shot upward to an altitude of 30°.

Eastport, Maine, 15th: a brilliant auroral arch was observed from 7 p. m. until 2 a. m. of the 16th; waves of light shot upward to the zenith and frequently to beyond that point. The arch covered 90° of the northern horizon.

Manistique, Michigan, 15th: an aurora was observed from 8.30 p. m. until daylight of the 16th; at 9 p. m. beams of a bright, greenish color were observed in the northwest, with a motion from east to west; at 9.30 it assumed the form of flashing patches of bright haze, constantly changing in shape and having a waving motion towards the zenith.

Beloit, Wisconsin, 15th: at 9.30 p. m. a pale bank of light was observed in the north; at 10 it had spread over the sky from northwest to northeast, and streamers extended to an altitude of about 50°; it was again observed at 12.30 a. m. as a bank of light, extending to a considerable height.

Portland, Maine, 15th: an aurora was observed from 9 p. m. until after midnight; when first seen it consisted of an irregular arch covering 110° of the horizon and extending to an altitude of 16°; at 10.15 p. m. streamers reached an altitude of 45°. The arch disappeared at 11 p. m. and the light was obscured by clouds after midnight.

Fort Bennett, Dakota, 16th: a faint aurora was observed from 12.05 to 12.25 a. m., consisting of a few small streamers whose lower extremities were 15° above the horizon.

Manistique, Michigan, 15th: an aurora was observed from 10 p. m. to midnight; beams shot upward to an altitude of 30°; the display was very bright near the horizon.

Eastport, Maine, 17th: an auroral light was observed at 10 p. m., lasting until 1 a. m. of the 18th.

Alpena, Michigan, 27th: an aurora was first noticed at 9.40 p. m., consisting of a few small streamers in the north, having an altitude of 30° and an apparent motion from east to west.

Saint Vincent, Minnesota, 29th: a faint auroral display was observed from 10 to 11.15 p. m., consisting of a few streamers which extended to an altitude of from 10° to 15°.

Other auroral displays were observed during the month, as follows:

2d.—Manistique, Michigan.

3d.—Poplar River, Montana; Orono, Gardiner, and Cornish, Maine.

4th.—Lansing and Traverse City, Michigan.

5th.—Cambridge, Massachusetts; Prairie du Chien, Wisconsin.

14th.—Tatoosh Island, Washington Territory; Bangor and Gardiner, Maine; Cambridge, Massachusetts; Palermo, New York; Newport, Vermont.

15th.—Bangor, Gardiner, and Cornish, Maine; Sycamore, Illinois; Independence, Monticello, Manchester, and Humboldt, Iowa; Rochester, Minnesota; Harvard, Nebraska; North Volney, New York; Burlington, Woodstock, and Newport, Vermont; Madison, Embarras, and Prairie du Chien, Wisconsin.

17th.—Woodstock and Newport, Vermont.

18th.—Manistique, Michigan; Archer, Florida, "aurora plainly seen in the north and northeast."

26th.—Cedar Rapids, Iowa.

27th.—Fort Totten, Dakota.

THUNDER-STORMS.

Thunder-storms were reported in the various states and territories, as follows:

Alabama.—4th, 5th, 6th, 9th, 10th, 14th, 15th, 17th, 19th, 30th.

Arizona.—1st to 6th, 9th, 10th, 11th, 25th.

Arkansas.—1st, 2d, 3d, 5th, 7th, 8th, 11th, 12th, 13th, 14th.

California.—1st, 5th, 6th, 24th, 25th.

Colorado.—2d to 7th, 12th, 18th, 20th, 24th, 26th, 27th, 29th, 30th.

Connecticut.—4th, 9th.

Dakota.—1st, 10th, 11th, 12th, 16th, 18th, 19th, 20th, 27th, 28th.

District of Columbia.—4th, 5th, 9th, 22d.

Florida.—1st to 23d, 25th, 27th, 30th.

Georgia.—5th, 8th, 9th, 14th, 15th, 16th.

Illinois.—3d, 4th, 5th, 8th, 12th, 13th, 19th, 29th, 30th.

Indiana.—2d, 3d, 6th, 7th, 8th, 12th, 13th, 19th, 23d, 24th.

Indian Territory.—3d, 4th, 9th, 11th, 27th, 28th.

Iowa.—3d, 4th, 8th, 11th, 12th, 13th, 17th to 20th.

Kansas.—1st to 9th, 11th, 12th, 26th, 27th, 28th.

Kentucky.—4th, 8th.

Louisiana.—1st, 3d, 4th, 5th, 7th, 8th, 9th, 11th, 13th, 14th, 17th to 20th, 29th.

Maine.—19th, 27th.

Maryland.—4th, 5th, 9th.

Massachusetts.—1st, 4th, 9th, 16th.

Michigan.—1st, 8th, 11th, 12th, 13th, 17th, 20th, 21st, 28th, 29th.
Minnesota.—11th, 12th, 17th, 19th.
Mississippi.—7th, 13th.
Missouri.—1st to 7th, 8th, 11th, 12th, 13th, 30th.
Montana.—1st, 10th, 13th, 15th.
Nebraska.—3d, 4th, 7th, 8th, 11th, 17th, 18th, 27th.
New Hampshire.—9th, 22d.
New Jersey.—1st, 4th, 5th, 9th, 15th.
New Mexico.—27th.
New York.—1st, 3d, 4th, 8th, 9th, 13th, 15th, 18th, 21st, 22d.
North Carolina.—3d, 4th, 14th, 15th, 16th, 29th.
Ohio.—1st, 3d, 4th, 8th, 9th, 12th, 13th, 14th, 18th, 19th, 23d.
Oregon.—5th, 9th.
Pennsylvania.—1st, 3d, 4th, 8th, 9th, 18th, 22d, 29th.
South Carolina.—1st, 4th, 5th, 9th, 11th, 14th, 15th, 19th, 29th, 30th.
Tennessee.—2d to 5th, 8th, 9th, 12th to 15th, 18th, 25th, 29th, 30th.
Texas.—1st to 17th, 21st, 22d, 27th to 30th.
Utah.—11th, 12th, 25th.
Vermont.—1st, 9th, 22d.
Virginia.—4th, 5th, 8th, 9th, 14th, 23d.
Washington Territory.—9th, 14th, 15th.
West Virginia.—3d, 4th, 8th, 22d.
Wisconsin.—2d, 8th, 11th, 12th, 17th, 19th, 27th.
Wyoming.—25th.

OPTICAL PHENOMENA.

SOLAR HALOS.

Solar halos were observed in the various states and territories, as follows:
Arizona.—Prescott, 5th.
California.—San Diego, 1st, 2d, 5th, 13th; San Francisco, 4th, 7th, 14th, 28th; Sacramento, 8th; Poway, 5th.
Colorado.—Montrose, 3d, 8th.
Dakota.—Webster, 4th; Fort Buford, 15th, 21st; Fort Totten, 19th; Yankton, 27th.
Florida.—Archer, 4th, 17th, 19th, 20th; Key West, 13th, 16th, 21st; Manatee, 15th.
Georgia.—Augusta, 19th, 26th.
Illinois.—Springfied, 1st, 3d, 5th, 26th; Charleston, 1st, 5th, 11th, 27th; Riley, 4th.
Indiana.—Jeffersonville, 11th, 15th; Laconia, 26th.
Indian Territory.—Fort Reno, 20th.
Iowa.—Cedar Rapids, 1st, 5th, 10th, 13th, 14th, 16th, 21st; Keokuk, 1st, 11th.
Kansas.—Yates Centre, 4th.
Maine.—Cornish, 8th.
Maryland.—Woodstock, 20th, 27th.
Massachusetts.—Amherst, 22d.
Michigan.—Swartz Creek, 6th; Port Huron, 12th, 18th; Grand Haven, 26th, 27th.
Minnesota.—Saint Vincent, 8th; Duluth, 9th.
Missouri.—Saint Louis, 4th.
New Jersey.—Somerville, 21st.
New York.—Mountainville, 4th; Buffalo, 7th, 8th, 11th, 12th, 14th, 24th, 28th, 29th; Palermo and Syracuse, 8th; Albany, 17th; New York City, 21st.
North Carolina.—Fort Macon and Statesville, 17th.
Ohio.—Wauseon, 7th, 27th, 30th; Toledo, 27th; Cleveland, 29th.
Pennsylvania.—Philadelphia, 6th; Dyberry, 21st, 22d; Troy, 22d.
Rhode Island.—Block Island, 21st.
South Carolina.—Stateburg, 8th, 9th, 16th, 17th, 18th, 26th; Spartanburg, 12th, 17th.
Tennessee.—Nashville, 6th, 9th, 15th, 16th, 17th, 26th; Chattanooga, 19th.
Vermont.—Strafford, 8th.
Virginia.—Cape Henry, 9th; Lynchburg, 20th, 27th; Dale Enterprise, 22d, 27th to 30th.
Washington Territory.—Dayton, 16th; Bainbridge Island, 17th.
Wisconsin.—Milwaukee, 6th; Manitowoc, 11th.
Wyoming.—Fort Bridger, 3d, 5th, 29th.

LUNAR HALOS.

Lunar halos were observed in the various states and territories, as follows:
Alabama.—Mobile, 17th, 18th, 20th; Montgomery, 18th.
Arizona.—Fort Apache, 23d.
Arkansas.—Fort Smith, 14th; Little Rock, 18th.
California.—Fort Bidwell, 27th, 28th.
Colorado.—Montrose, 20th.
Connecticut.—Bethel, New Haven, and North Colebrook, 21st.
Dakota.—Fort Totten, 15th; Fort Buford, 21st; Webster, 19th.
Florida.—Manatee, 14th; Jacksonville, 16th; Archer, 16th, 19th; Cedar Keys, 16th, 23d; Key West, 16th, 17th, 19th, 20th, 24th, 26th; Tallahassee, 17th; Sanford, 23d, 24th.
Georgia.—Atlanta, 15th, 17th.
Idaho.—Boisé City, 3d.
Illinois.—Peoria, 26th.
Indiana.—Terre Haute, 17th; Jeffersonville, 19th, 21st, 22d, 23d.
Iowa.—West Union, 22d; Keokuk, 26th.
Kansas.—Wyandotte, 23d, 28th.
Kentucky.—Frankfort, 20th.
Louisiana.—New Orleans, 15th; Point Pleasant, 16th.
Maine.—Bangor, 17th.
Maryland.—Ocean City, 20th; Baltimore, 20th, 27th.
Massachusetts.—Amherst and Deerfield, 20th; Boston, Somerset, and Taunton, 21st.
Michigan.—Manistique, 17th; Escanaba, 17th, 19th; Marquette, 17th, 27th; Alpena and Swartz Creek, 19th; Grand Haven, 26th, 27th.
Minnesota.—Duluth, 19th; Saint Paul, 21st.
Montana.—Fort Benton, 18th; Fort Assinaboine, 19th; Fort Maginnis, 20th; Poplar River, 21st.
Nebraska.—Marquette, 8th.
New Jersey.—Barnegat City, Somerville, Dover, and Princeton, 21st; Readington, 21st, 29th.
New York.—Menand Station (near Albany), 20th; New York City, Mountainville, and Setauket, 21st.
North Carolina.—Wilmington, 5th, 17th; Hatteras, Statesville, and Flat Rock, 17th.
Ohio.—Tiffin, 17th; Wauseon, Sandusky, and Toledo, 27th; Ruggles, 29th.
Oregon.—Linkville, 16th.
Pennsylvania.—Pittsburg, 20th; Philadelphia, Fallsington, and Chambersburg, 21st.
Rhode Island.—Point Judith and Block Island, 21st.
South Carolina.—Spartanburg, 14th, 16th, 26th; Stateburg, 18th.
Tennessee.—Nashville, 15th, 16th; Chattanooga, 15th, 18th, 21st; Knoxville, 17th.
Texas.—Cleburne, 13th; Indianola, 15th, 16th, 20th, 21st; Brownsville, 16th, 17th, 18th; Rio Grande City, 17th, 19th, 20th; Galveston, 20th, 23d; Palestine, 24th.
Virginia.—Cape Henry, 8th, 27th; Bird's Nest, 15th, 20th, 26th, 27th; Wytheville, 17th, 18th, 19th; Dale Enterprise, 17th, 27th, 30th; Fort Myer and Chincoteague, 20th.
Washington Territory.—Tatoosh Island, 13th.
West Virginia.—Parkersburg, 20th.
Wisconsin.—Embarras, 17th; Milwaukee, 28th.
Wyoming.—Fort Laramie, 16th, 17th.

The phases of the moon during September were: last quarter, 2d, 12.09 a. m.; new moon, 8th, 3.37 p. m.; first quarter, 16th, 1.09 a. m.; full moon, 24th, 2.49 a. m.; perigee, 6th, 9 a. m.; apogee, 18th, 5.24 a. m.